

Little Vulcan Mountain Bighorn Sheep Habitat Enhancement Project Environmental Assessment (EA#OR135-FY03-EA-02)

Introduction and Background

A bighorn sheep habitat enhancement project is proposed for approximately 390 acres on Little Vulcan Mountain, in portions of T. 39 N., R. 32 E., Sections 1 and 12, T. 39 N., R. 33 E., and Section 7, W. M. (see map). This area is in northern Ferry County about 5 miles northwest of the community of Curlew, Washington.

The project area is within the Spokane District's Northeast Management Area and is managed by the Border Resource Area. This area is also within a grazing allotment identified in the Spokane Resource Management Plan/EIS (RMP) 1985. The grazing allotment was initially categorized as C1 (custodial) for management purposes. Due to current management and the Area of Critical Environmental Concern (ACEC) designation in the 1992 RMP Amendment (pg 21), the Little Vulcan Mountain management area was recategorized as an "I" (Improve) allotment. The 1992 RMP Amendment states the primary management objective of this area is to maintain or enhance the bighorn sheep habitat.

Much of the traditional bighorn sheep range and lambing habitat in the Little Vulcan Mountain area is located on federal lands, including BLM-administered land. In 1995, the U.S. Forest Service (USFS)-in cooperation with the Bureau of Land Management, Washington State Department of Natural Resources (DNR), and the Washington Fish and Wildlife Service--implemented the *California Bighorn Sheep Habitat Improvement Through Prescribed Burning*. Evaluation by the Forest Service and BLM district biologist determined that the prescribed burning project did not sufficiently reduce tree densities to meet all habitat objectives. Subsequently, the Forest Service initiated the Littlehorn Project on adjacent lands in May 1998. That project focused on enhancing California bighorn sheep habitat by thinning trees, utilizing prescribed fire, and seeding desirable forage species.

Purpose and Need for Proposal

Over the last decade, the Little Vulcan bighorn sheep population has declined from more than 150 animals to fewer than 30. A possible contributing factor to the reduced sheep population is that Douglas-fir and ponderosa pine trees have increased in number and density due to exclusion of fire and limited harvest. The increased tree densities reduce visual security, which is a major habitat component for the sheep. The purpose of the proposed restoration is to improve visual security, forage availability, and proximity to escape cover.

The bighorn sheep Aregular large concentration@habitat is roughly 5,200 acres, two-thirds of which is state and federal lands. The main lambing area is approximately 500 acres and primarily located on BLM and state land. Therefore, the proposed habitat restoration responds to a need to participate in coordinated vegetative treatments with other agencies, including the USFS, DNR, and local landowners. These coordinated treatments would help increase suitable bighorn sheep habitat over a larger area.

Alternatives

Three alternatives were developed: Alternative 1 (Proposed Action-Thinning of Understory and Overstory), Alternative 2 (Thinning of Understory), and Alternative 3 (No Action). Each of these alternatives is described individually below.

Alternative 1 - Proposed Action (Thinning of Understory and Overstory)

The proposed restoration includes harvesting of about 1 million board feet of timber through a thinning prescription, manual site preparation, prescribed burning, and fencing. The harvest area would encompass about 205 acres in three separate harvest units (see map).

Douglas-fir and ponderosa pine would be thinned to provide 600 feet of sight distance through the stands. Selected trees (between 8 and 23 inches dbh) in the overstory and understory would be removed. Selected stands with 70% and greater canopy-cover that are located in strips along draws and on northern aspects. would be retained. Due to topography, most of the area is not accessible to ground-based harvest techniques and machinery. Helicopter yarding would be the predominant harvest method because slopes on most of the 205 acres proposed for harvest area range from 40 to 60 percent. A small portion of the area, approximately 20 acres (see map), could be harvested using ground-based yarding methods. Tree tops and limbs would be lopped and scattered to a height not to exceed 24 inches above the ground. No additional roads would be constructed under this alternative.

Site preparation and fuel mitigation would be accomplished at several locations within the harvest area and involve removal of understory vegetation (brush) to create openings. The brush would be manually cut and piled for later burning. In addition, unmerchantable understory trees of all conifer species would be thinned and hand piled, through a service contract. Small trees, tree and brush piles, and other logging slash would be burned after harvest activities are completed to reduce onsite fuel loading. Fire-susceptible lower branches of retained trees would be pruned. Underburns would be used periodically in the future to reduce fuel loads and maintain the vegetative community. Burning would be accomplished in accordance with a designated burn plan. Fire lines would be constructed to contain prescribed fires.

Some range improvements could be implemented, including fencing of the boundary between private landowners and BLM (see map), to facilitate livestock management on Allotment #0666. Fencing would be implemented to ensure compliance with *The Rangeland Health Standards and Guides*. The fence would be designed with openings, and rocks would be placed in these openings to limit livestock access, while allowing bighorn sheep movement across the rocks.

Alternative 2 – Thinning of Understory

This alternative proposes thinning of the understory (trees less than 8 inches in diameter) through use of a service contract or force account crew. In areas where small trees predominate, trees would be thinned to a minimum 16-foot spacing to achieve desired spacing requirements to improve bighorn

sheep habitat. No trees larger than 8 inches (dbh) would be cut. Tops and branches would be lopped and scattered to a height not to exceed 24 inches. Prescribed fire and range improvements could be implemented as described in Alternative 1.

Alternative 3 - No Action

No harvesting, thinning or burning of trees and brush would be done.

Other Alternatives Considered But Not Analyzed in Detail

Understory Burning - Burning vegetation to thin stands enough to provide visual security was considered, but was not analyzed in detail because it would not accomplish the objectives. Previous attempts to accomplish goals by burning alone did not sufficiently reduce the understory vegetation; its benefits were short term.

Management Actions Common to Action Alternatives 1 and 2

Fuels Management

- Prior to any prescribed burning proposed in the subject area, a burn plan will be prepared identifying the mitigation measures needed to protect site-specific resource values, notification procedures for local area residents, and potential fire behavior and precautions.

Range Improvements

- \$ Additional range improvements will be constructed, as determined by monitoring, to achieve or maintain rangeland health standards as required by 43 Code of Federal Regulations, Subpart 4180 (Rangeland Health). Range improvements include any project or construction activity (such as fences, spring developments, and cattle guards) occurring within the rangeland ecosystem that is designed to achieve or maintain rangeland health standards as described in *Standards for Rangeland Health and Guidelines for Grazing Management* (USDI 1997).
- \$ The grazing lessee will maintain all range improvements. The BLM may contribute materials, if available, for major repair work.

Resource Inventories

- \$ Appropriate resource inventories (including cultural, paleontological, botanical and wildlife) will be conducted prior to implementing any on-the-ground activities. If important resources are identified or located, the project would be redesigned to reduce or eliminate impacts to those resources. If cultural properties cannot be avoided, consultation will be conducted with the Office of Archaeology and Historic Preservation, tribal governments and historical societies, as appropriate, and in some cases the Advisory Council on Historic Preservation.

Water/Riparian Resources

- \$ 50-foot buffers will be maintained around the intermittent stream and seeps (see map). No activity will occur within these buffers.

Noxious Weed and Invasive Plants

- \$ Noxious weeds will be treated using chemical or biological methods, according to the *Final EIS for Vegetation Treatment on BLM Lands in Thirteen Western States* dated July 1991, the Spokane District Noxious Weed Control Environmental Assessment, and any subsequent updates, revisions, or replacements to either of these documents.

Wildlife

- \$ If an active goshawk nest is found during timber harvest activities, a minimum of 30 acres of the most suitable habitat surrounding the nest will be excluded. Sale activities within a post-fledgling area, as determined by a wildlife biologist, would be delayed to minimize disturbance during the bonding and nesting period, through a seasonal restriction from April 1 to August 30.
- \$ No harvest or harvest-related activities will occur between November 15 and July 1 to prevent disturbance to wildlife, specifically big game fawning protection and displacement of wintering grouse from important habitat.
- \$ If an active golden eagle nest is discovered within 0.5 mile of a harvest unit, no helicopter overflights would be allowed within one mile of the nest trees during the nesting season (April 1 through August 30).
- If any bald eagle nests are found, they will be protected according to the Pacific Bald Eagle Recovery Plan (USDI 1986).

Cultural Resources

- \$ Prior to implementing any ground-disturbing activities, Class III surveys (30-meter transects) will be conducted through terrain on less than 50% slope. On steeper and less sensitive areas, transects will be conducted at 50 to 60 meter intervals or wider spaces, as the terrain and/or vegetation dictates.
- \$ All cultural sites requiring protective measures will be identified by flagging in the field and with a global positioning system (GPS) receiver on office maps. Sacred or spiritual sites identified through consultation with the Confederated Tribes of the Colville Reservation will also be protected.
- \$ Sites or features that could be adversely affected by fire will have 50-foot buffers or fire-exclusion zones created through natural fuel breaks, back-burning techniques, and/or hand-constructed fire line.
- \$ During harvest operations, trees will be directionally felled away from cultural sites.
- \$ Any ground-disturbing activities within cultural site boundaries will be reviewed by a BLM Archaeologist prior to being implemented.

Socioeconomic

- Dust abatement (water, lignin, or magnesium chloride) will be used on existing roads in the project area to provide driver safety and protect the road surface by stabilizing and binding the aggregate road surface
- Helicopter operations will be conducted only during daylight hours.

Affected Environment and Environmental Consequences

The following text is presented by affected environment and environmental consequences for each resource value considered in the analysis. The focus is on resources that have potential significant impacts.

Vegetation

Affected Environment

Vegetation/Plant Communities: Forested plant associations in the project area are Douglas-fir/ninebark association at lower elevation sites and protected areas such as draws, and the Douglas-fir/ponderosa pine/bluebunch wheatgrass association at higher elevations and on south-facing slopes. The historic average fire return interval did not exceed 25 years. With the exclusion of fire, Douglas-fir (a shade-tolerant species) has become the dominant tree species. The resulting stands have undergone a transition from widely scattered large ponderosa pine and Douglas-fir to stands dominated by small size trees. The overstory canopy has some large remnant Douglas-fir and ponderosa pine trees (up to 48 inches dbh). Douglas-fir regeneration, small pole-size trees (<8 inches in diameter), and larger brush (ninebark) occupy lower canopy levels. A tree canopy with vertical fire ladders occupies a large percentage of the area.

Grassland communities on the project area include Idaho fescue-bluebunch wheatgrass on relatively level ground, and bluebunch wheatgrass/needle-and-thread on steep slopes. Rock outcrops are dominated by *Selaginella* spp. and the moss *Tortula*, with wax currant and Michaux's sagebrush in cracks and soil pockets. Stands of quaking aspen/snowberry occur as pockets in the open grasslands. The flat meadow in the west central portion of the project area is dominated by Kentucky bluegrass and supports primarily non-native plant species. Areas such as Moran Meadows, part of which is privately owned, and meadows adjacent to cliff habitats are currently at an early seral stage and support a bluegrass community type.

Special Status Plant Species: Based on distribution records from the Washington Natural Heritage Program (1999), 15 special status plant species potentially occur in the area. Field evaluation of the proposed project area determined that habitat for many of the potential Special Status species is not present.

Brittle prickly-pear (*Opuntia fragilis*), a Washington Review 1 species (under consideration for state listing), was found in the project area.

Plants of Cultural Importance: Several berry-producing shrubs occur in the project area and include serviceberry, kinnikinnick, Oregon grape, black hawthorn, chokecherry, wax currant, swamp gooseberry, rose, raspberry, and thimbleberry. Water birch and willow, also of use to original peoples, are present in the project area.

Noxious Weeds: Scattered populations of diffuse knapweed are found within the project area. Also, houndstongue and Canada thistle are scattered throughout the area, but are not as abundant as knapweed.

Impacts on Vegetation

Alternative 1 - Proposed Action

The proposed action would reduce tree density and size classes and open the forested stands, causing a short-term increase in cover of grass species and associated forbs. Shrub growth would also likely increase in the forested areas. If use by bighorn sheep and other wild ungulates increases in areas outside the harvest/burn perimeter; herbs and shrubs in adjacent areas could experience increased grazing/browsing. The fence construction would allow better management of livestock grazing and contribute to achieving or maintaining rangeland health standards on the allotment.

Alternative 2 - Thinning

Under this alternative, effects on grass/forbs and shrubs are expected to be similar but less pronounced than under Alternative 1. Removing most of the non-merchantable trees less than 8 inches dbh would partially meet the desired levels necessary to create visual security for approximately 10-15 years. The remaining larger diameter trees (>8 inches dbh) would then be more resistant to low-moderate intensity fires and would likely survive under burning treatments. Stands would be opened up, but to less extent than Alternative 1.

Alternative 3 - No Action

Under this alternative, the forested areas would become denser over time, with increased numbers of invasive vegetative species, which would outcompete understory grasses and forbs. Forest health would continue to decline, possibly resulting in extensive stand mortality and subsequent heavy fuel loading. Ladder fuels would have potential to allow fire movement into tree crowns. This vegetative condition would create potential for stand-replacing fire and corresponding resource losses. Adjacent federal and private lands would be susceptible to increased potential for fire and disease.

Impacts on Special Status Species

No impacts to the Review species brittle prickly-pear are expected under any alternative. This plant occurs in open grassland rather than forested habitat, and is unlikely to be consumed by livestock or wild ungulates.

Impacts on Noxious Weeds

Under both action alternatives, noxious weeds could invade or continue to spread through the proposed project area as a result of soil disturbances and openings created in the forest canopy.

However, weed control measures would contain populations within acceptable levels.

Under all alternatives, including No Action, noxious weeds would continue to spread from various sources, such as hikers, livestock, wildlife movement, fire and prevailing winds.

Soils

Affected Environment

The proposed project area has two primary soil types: Molson Stony loam on 24 to 40 percent slopes; and Pepoon-Edds Complex on 15 to 50 percent slopes. The Molson soil is characteristically deep and well drained with moderate permeability and rapid runoff, and has moderate to high available water capacity. Pepoon-Edds Complex is shallow and well drained with moderate permeability, medium to very rapid runoff, and very low available water capacity. Both soils have a severe erosion hazard. The remainder of the soils within this unit consist of rock land and various rock land/soil complexes.

The soils are relatively stable, productive, and considered to be functioning. Areas of soil compaction tend to be limited to roads and trails and comprise a small percentage of the project area.

Impacts on Soils

Alternatives 1 & 2

Alternatives 1 and 2 would have little to no effect on soils. Some soil disturbance would occur with fire line construction or dragging of logs on the ground during helicopter yarding. Reducing the forest canopy would expose bare soil, making those areas more susceptible to erosion when it rains.

However, the potential for erosion is expected to be short term, because openings created in the forest canopy would stimulate grass/forb production on the forest floor, subsequently aiding soil stability.

Alternative 3

The dense stand conditions that are present and expected to worsen under the No Action Alternative would create potential for intensive wildfires. Such fires damage soils by accelerating surface erosion and displacement. The affected soils would have reduced productivity.

Water/Riparian Resources

Affected Environment

The proposed project area contains three to four seeps and one intermittent drainage area that is classified as a type 5 surface water (see map). The Washington State Forest Practice Rules describe a

Type 5 water as streams with or without well-defined channels, areas of perennial or intermittent seepage ponds, natural sinks, and drainage ways having short periods of spring or storm runoff.

Impacts on Water/Riparian Resources

Alternatives 1 & 2

The 50-foot buffers would adequately protect seeps within the project area, as well as the ephemeral drainage area. An increase in surface flow could occur due to the reduced vegetative cover. This would vary on an annual basis due to the varied climatic factors, such as precipitation and runoff events.

Alternative 3 – No Action

Under Alternative 3, water resources would not be impacted and would continue to function as in their present condition.

Wildlife Habitat

Affected Environment

The open ponderosa pine and Douglas-fir tree stands, dense Douglas-fir tree stands, several large snags, large down logs scattered throughout the project area, along with aquatic habitats, provide habitat for various wildlife species. Habitats surrounding the planning area are very similar to the project area, with larger stands of trees occurring to the north on adjacent federal lands.

Wildlife species likely to occur in the planning area were determined from the Washington State Natural Heritage Database and from Cassidy et al (1997).

- \$ Mammals: bighorn sheep, mountain lion, black bear, mule deer, white-tailed deer, bat species (California myotis), bobcat, pine squirrel, northern flying squirrel and yellow pine chipmunk.
- \$ Cavity nesters: pileated woodpecker, black-backed woodpecker, red-naped sapsucker, Williamson's sapsucker, northern flicker, hairy woodpecker, black-capped chickadees and mountain chickadees.
- \$ Migratory land birds: Townsend's warbler, red crossbill, pine siskin, red-breasted nuthatch, golden-crowned kinglet, ruby-crowned kinglet, winter wren, yellow-rumped warbler, Swainson's thrush, brown creeper, and dark-eyed junco.

Three Federal/state-listed special status species (gray wolf, bald eagle, and Canada lynx) and one Washington State Endangered species (Fisher) could use the project area for part of their life cycle: Grizzly do not occur as residents in the area. The biological assessment for this project tiers to the Programmatic Biological Assessment of the Spokane District Land Use Plan, Area 2 (USDI. 2002). The following discussion provides more specifics on each.

- \$ Gray Wolf (Federal and State Endangered): The proposed project is located outside designated recovery areas of the gray wolf (U.S. D.I. 1987) and does not contain habitat proposed as critical

or identified as linkage habitat between recovery areas. Transient individuals may pass through or hunt in the area. No denning activities have been documented recently in this part of Washington.

- \$ *Bald Eagle* (Federal and state Threatened): The bald eagle is known to use the Columbia River corridor and major tributaries year round. The project area is located less than one mile from the Kettle River. There are no documented bald eagle nests within two miles of the project area, but migratory bald eagles may occasionally pass through the area.
- \$ *Canada Lynx* (Federal and State Threatened): The project area is located outside mapped Canada lynx habitat as defined under the Lynx Conservation Assessment and Strategy, Ruediger et al. (2000). The nearest defined lynx habitat is about 6 miles to the south of the project area, and the nearest recorded observations are about 9 miles to the north. Given the large home range of lynx and their tendency to wander outside of their territories, it is possible that lynx could occasionally pass through or hunt in the project area.
- \$ *Grizzly Bear* (Federal Threatened): The project area is located outside any grizzly recovery area (USDI 1993). Although grizzly could potentially move through the area from populations in Canada, the area is not suitable habitat because of its proximity to human developments. Grizzly do not likely remain in the area.
- \$ *Fisher*: (Washington State Endangered, Federal Candidate Species): In 1989, there was a verified sighting of a fisher approximately 4 miles southeast of the project area. Fishers are associated with dense late-successional forest types and considered as generalized predators, with a diet of prey species such as squirrels, birds, snowshoe hares and carrion. The project area is suitable fisher habitat that could be used for foraging, denning or resting sites (WDFW 1998).

Other Wildlife Notes

Six Species of Concern could occur in the general project area: Northern Goshawk, Long-legged myotis, Long-eared myotis, Townsend=s big-eared bat, Willow flycatcher, and Columbia Spotted Frog. The occurrence likelihood of each of these is explained below:

- Northern Goshawks could potentially occur in the project area, although the tree cover is more sparse and fragmented than they prefer for nesting. Goshawks have been observed within five miles of the project area, and the project area is potential habitat for goshawk nesting and foraging. Surveys for this species in 2002 found none in the area.
- \$ Bats (Long-legged myotis, Long-eared myotis, and Townsend=s big-eared bat) could occur in the area along with common bat species. Bats may roost in large snags in the project area, but are not likely abundant due to lack of open water.
- \$ Willow flycatchers may use shrub-dominated openings.
- \$ The Columbia spotted frogs prefer more extensive wetlands than are present in the project area and are not known to occur within the project area , other aquatic species such as tree frogs, and other small aquatic wildlife and invertebrates likely use the spring/seep and intermittent stream habitats.

The wolverine could hunt or pass through the area, but is not likely to den here due to a lack of high elevation talus slopes.

Upland game birds (specifically blue grouse and ruffed grouse) are year-round residents of the project area.

Osprey could nest in the project area. Other raptors that could nest and forage in the area include: golden eagle, red-tailed hawk, turkey vulture, raven, Cooper's hawk, sharp-shinned hawk, great horned owl, pygmy owl, and great gray owl. Golden eagles have been documented within half a mile of the proposed treatment area and are known to nest within 4 miles of the project area.

Impacts on Wildlife Habitat

Alternative 1 - Proposed Action

This alternative would reduce the number of small to moderate-sized trees in the project area, creating a much more open stand condition. The hiding cover for deer that is now provided by some patches of trees and tall shrubs would be greatly reduced; however, some patches of hiding cover would remain, primarily in the riparian stringers. The prescribed fire following harvest would rejuvenate decadent shrubs and increase the cover of grasses and forbs, thereby increasing forage availability for wild ungulates, including bighorn sheep.

As this stand is opened up, the larger trees would have less competition from small trees. Wildlife habitat would be maintained. If currently present, pileated woodpeckers, brown creepers, northern goshawk, pine squirrel, and fisher would likely continue to use the area, foraging, nesting, or denning in the snags or remaining large trees. Reducing the tree density and opening the stands would provide areas that bighorn sheep could find cover for visual security from predators.

The three Federally listed species would not be adversely affected by this alternative. Consultation with the U.S. Fish and Wildlife Service on February 26, 2002, led to a determination of no effect on the grizzly bear, and a "may affect but would not adversely affect" on the bald eagle, Canada lynx, and gray wolf. The endangered gray wolf and threatened grizzly bear could continue use of the project area, if they occur in or pass through the area. The Canada lynx would be less likely to den in the project area, but would more likely forage in the area as snowshoe hare populations increase with additional forage growth. The area is already too open to be quality lynx habitat. Bald eagles would still have adequate numbers of roost and nest trees available.

No state-listed species would be adversely affected by this alternative, except for fisher. Fisher could be slightly impacted since they would be less likely to den in the project area, but could still do so. Fisher would more likely forage in the project area, as snowshoe hare populations could increase with the additional forage.

Alternative 2 - Thinning

Since fewer large trees would be removed under this alternative, the habitats would not be as open as under Alternative 1 (Proposed Action). There would be fewer shrubs and grasses produced for big game forage, and bighorn sheep would have less security from predators than under the Proposed Action Alternative. The resulting vegetative changes may not improve habitat conditions sufficiently to increase bighorn sheep populations.

Alternative 2 would move the habitat towards the pre-settlement conditions that wildlife are adapted to, but would leave more mature conifers than historically present. In the long term, the greater number of trees retained would stress older trees, increasing the number of snags and down wood, as well as the loss of some large trees. This could provide more habitat for pileated woodpeckers and other species adapted to dense forest conditions, but for most wildlife species there is little difference between Alternatives 1 and 2, since both would retain functional corridors. Wildlife diversity would be similar.

Alternative 3 - No Action

Forage plant cover and vigor for big game species would continue to decline, reducing forage availability over the long term. Populations of wildlife species adapted to the open, historic condition of the area, would continue to decrease. The population of large predators such as mountain lion and black bear would likely be maintained or increase over the long term. However, populations of bighorn sheep and mule deer would continue to decrease. Smaller predators that may occur in the area (such as fisher, bobcat, and lynx) may use the area less in correlation to decreasing prey populations.

Aquatics and Fisheries

Affected Environment

There are no fish-bearing streams within the project area. Columbia spotted frogs, tree frogs, and other small aquatic wildlife and aquatic invertebrates may use the intermittent stream and adjacent wetlands.

Impacts on Aquatics and Fisheries

Alternatives 1 & 2

Alternatives 1 and 2 could result in slightly more available water for aquatic species in these intermittent channels. Additional sediment into local channels or downstream river systems are expected to be slight from either action alternative since little soil disturbance would be created by helicopter logging. The long term improvement in range conditions under the action alternatives would more than offset any short-term increases in sediment.

Alternative 3 – No Action

The No Action Alternative could result in a decrease of available surface water.

Cultural Resources

Affected Environment

The proposed project is located within the ethnographic traditional use area of the Lakes people, who today partly comprise the Confederated Tribes of the Colville Reservation. The Lakes people traveled seasonally to hunt or gather resources throughout the Kettle River drainage system. Winter villages, usually located in sheltered low-elevation areas, were abandoned in the spring to gather roots, hunt game in the mountains, and to fish in the Kettle River and other nearby streams. Temporary camps were often constructed for these purposes.

Although the Little Vulcan Mountain project area is situated within 0.25 mile of the Kettle River, the adjacent terrain is very steep and rugged, making the southernmost portion less likely to contain cultural resources than the northern portion of the project area. Topography of the northern two-thirds of the project area is variable, exhibiting steep to gentle slopes with small ridges, peaks, saddles and upland plateaus. The connected ridge system may have served as an upland trail for use by American Indians in the area. The upland trail system would have facilitated movement during hunting expeditions and seasonal treks to fishing sites, especially when less direct riverine routes were prone to flooding, as would be expected in the annual spring runoff months. The western edge of the project area, especially near Moran Meadows, has a higher likelihood of containing cultural materials. A seasonally high water table and gentle terrain could have attracted both aboriginal and Euro-American inhabitants.

Most of this area has not been surveyed to current archaeological standards. No sites have been recorded. Previous cultural resource surveys located an early 1900s homestead adjacent to the project area on private land. Transects have also covered a portion of the upland trail mentioned above. One isolated artifact was located along this trail.

Impacts to Cultural Resources

Alternative 1 - Proposed

Cultural materials eligible for the National Register of Historic Places (NRHP) or those not yet evaluated are expected to be adequately protected by buffer zones and other management actions designed to protect cultural resources.

If these protective measures are observed, there will be no adverse direct or indirect impacts to cultural resources as a result of project implementation.

Alternative 2 - Thinning

As in Alternative 1, cultural resources are expected to be adequately protected by conducting surveys prior to implementing the project and identifying sites so that impacts from fire, brush disposal, or fence

construction would not occur. No adverse direct or indirect impacts to cultural resources would occur as a result of this project.

Alternative 3 - No Action

No impacts to cultural resources in the Little Vulcan Mountain area would occur as a result of this No Action Alternative.

Recreation

Affected Environment

The primary recreation uses in the general area of the proposed project are seasonal dispersed upland bird and deer hunting. Other recreational uses could include wildlife viewing, wild berry picking, horseback riding, dispersed camping, and some snowmobile use.

Forest Service and state lands (Department of Natural Resources) border the north and east sides of the project area. There is an open Forest Service road that provides public access to adjoining federal and State land and is located approximately 0.5 miles from the northeast boundary of the project area.

Impacts to Recreation

Alternatives 1 & 2

Additional fence installation could interfere with horseback riding access. Big game and upland birds would be displaced temporarily by the noise associated with logging and prescribed fire activity. Wildlife viewing opportunities would be enhanced if bighorn sheep populations increase as a result of proposed habitat restoration in Alternatives 1 and 2.

Alternative 3 – No Action

Without habitat restoration, there could be low or reduced bighorn sheep populations, resulting in fewer wildlife viewing opportunities.

Air Quality

Affected Environment

Air quality in the Vulcan Mountain area is rated high and is generally maintained throughout the year. Natural factors influencing air quality within the proposed project area include mountainous topography, prevailing southwesterly winds from the Columbia Basin, and weather fronts from the Pacific Ocean and Canada.

Impacts on Air Quality

Alternatives 1 & 2

Under both action alternatives (1 and 2), air quality could be temporarily and locally degraded by particulate matter and smoke from prescribed burning. However, the effects would be minimal considering that burning is prescribed to occur during times when air movement is conducive to dispersing the smoke.

Alternative 3 – No Action

Under Alternative 3, in the event a wild fire started in the area, air quality could be degraded for a short period of time, but of an intense nature due to the larger amounts of fuel that would ignite.

Socioeconomics

The Vulcan Mountain vicinity is a rural area with very little traffic and other forms of noise pollution. Primary land use is for residences and ranching. About a dozen residences are located within 5 miles of the proposed project area.

Also, the project area is totally within an authorized grazing lease (#0666), but only about 100 acres is accessible to cattle due to steep slopes and dense vegetation.

Alternatives 1 & 2

Helicopters flying above two county roads and nearby homes would create noise pollution for about 4 weeks during helicopter logging operations. Residents would be subject to hearing the helicopter noise.

Alternative 3 – No Action

There would be no impact on noise levels. The dense vegetative condition could pose a wildfire risk to the dozen nearby residences and adjoining areas.

Other Resource Elements Analyzed

Special Area Designations: The proposed action (Alternative 1) would enhance the bighorn sheep habitat as directed under the Area of Critical Environmental Concern (ACEC) designation for the area.

Environmental Justice: No disproportionately high and adverse human health or environmental effects on minority or low-income populations are expected to result from implementation of any of the alternatives addressed in this EA.

Other Resource Elements: Other resource values or elements considered in analyzing the alternatives included:

- \$ Wild and scenic rivers
- \$ Prime/unique farmlands
- \$ Special area designations
- \$ Wilderness
- \$ Hazardous/solid materials
- \$ Mineral/energy resources

The above listed resources are either not on the project site or would not be impacted.

Cumulative Impacts

The cumulative effects area includes all areas within a 5-mile radius of the project area. This encompasses an area large enough to incorporate the local deer population and the home range of wide-ranging predators such as lynx. Presently, there are many scattered houses on small acreage within this area, and additional housing is likely to be built. Road densities within this area are moderate and typical of northeastern Washington.

The cumulative effects of Alternatives 1 and 2 would be a decreased total tree density and canopy cover. These changes in forest structure would contribute cumulatively to the percentage of young forest and more open forest conditions created by other recent and proposed forest management projects within the surrounding landscape by the U.S. Forest Service and private landowners.

Thinning appears to be the predominant management prescription over much of the general area. This technique maintains some hiding cover and creates forage, thus providing adequate cover and forage for big game to be available in the future. This management system could increase road densities, although most of the required road system already appears to be in place.

The cumulative effects of Alternative 2 would be similar to Alternative 1 (Proposed Action). This alternative would contribute to a decreased total tree density and canopy cover within the cumulative effects analysis area into the near future. These changes in forest structure contribute cumulatively to the percentage of young forest and more open forest conditions created by other recent and probable forest management projects within the surrounding landscape by the U.S. Forest Service and private landowners. This alternative, cumulatively with actions on surrounding ownerships, would move habitat conditions towards historic pre-settlement conditions, but to a slightly lesser extent than the preferred alternative.

The cumulative effects of Alternative 3 would allow the tree stand density to increase, resulting in additional fuel loads and increased risk of wildfire. Increased tree stand density would also reduce existing habitat suitable for bighorn sheep, mule deer, and other wildlife species. However, the current stand densities could favor other wildlife species, such as whitetail deer. In addition, the dense forest canopy could result in reduced infiltration of water into the soil substrates, possibly limiting subsurface water flows. If left untreated, the open slope ponderosa pine bunch grass community would be replaced

with dense multiple-age class Douglas fir stands. The No Action Alternative would not contribute to the return of historic desired habitats.

Coordination/Consultation With Other Agencies, Groups, and Individuals

This environmental assessment was prepared by an interdisciplinary team of BLM resource specialists (see EA cover page).

Consultation was done with the Washington Department of Wildlife. The proposed project is being coordinated with forestry and wildlife staff of the U.S. Forest Service Ranger District in Republic, Washington. Additional coordination has involved joint field trips and coordination with the USFS interdisciplinary team, District Ranger, big game biologist, and a fuels specialist.

In an attempt to locate any traditional cultural properties or sacred sites in the project area, a consultation letter was sent to the Confederated Tribes of the Colville Reservation during the week of January 20, 2002. Consultation has also been initiated with the State Office of Archaeology and Historic Preservation and the Kettle River History Club. No concerns regarding cultural resources or sacred or spiritual sites have been expressed.

This EA will be posted on the “Planning” page of the Spokane District web site at www.or.blm.gov/spokane for a specified public review period. The EA will also be posted at local business establishments in Curlew that are frequented by residents in the project area, as well as the Curlew Post Office. In addition, a news release will be sent to the Republic News Miner newspaper announcing availability of the EA and summarizing the proposed project.

Literature Cited

Cassidy, K.M., C.E. Grue, M.R. Smith, K.M. Dvornich, eds. 1997. Washington State Gap Analysis – Final Report. Washington Cooperative Fish and Wildlife Research Unit. Univ. of Washington, Seattle, Vol 1-5.

Ruediger, B., J. Claar, S. Gniakdek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada lynx conservation assessment and strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Missoula, MT 122 p.

Washington Department of Fish and Wildlife. 1998. Priority habitats and species list. Washington Department of Fish and Wildlife, Olympia, WA.

U.S. Department of the Interior, Bureau of Land Management. 2002. Programmatic Biological Assessment of the Spokane District Land Use Plan, Area 2. Spokane District – BLM. 26p.

U.S. Department of the Interior. 1993. Grizzly bear recovery plan. U.S. Fish and Wildlife Service, Denver, CO. 181p.

U.S. Fish and Wildlife Service. 1986. Recovery plan for the Pacific bald eagle. U.S. Fish and Wildlife Service, Portland, OR. 160 p.

U.S. Fish and Wildlife Service. 1987. Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife Service, Denver, CO. 119 p.